

### REMARKS

The claims have been amended to recite that the vinyl compound (a) is a Michael addition acceptor, and claims 4, 9, and 32 have been changed to the opposite of their previous scope. Also submitted herewith for the consideration by the Examiner is an article by Imanzadeh et al. from *Molecules* 2010, 15, 7353-7362.

The rejection of all claims under 35 U.S.C. § 102 over Dammann should not be repeated.

The resin composition of the present invention is a liquid which is curable by, for example, ultraviolet radiation. The resin composition is a Michael addition reaction product of a Michael addition acceptor monovinyl group containing compound reactant, multifunctional acrylic ester reactant, and  $\beta$ -dicarbonyl group containing compound or resin reactant in which the  $\beta$ -dicarbonyl group has two activated hydrogen atoms in its methylene position. The three Michael addition reactants are employed such that the equivalent ratio of the vinyl group of the vinyl group containing compound to the activated hydrogen atom is in the range of 0.01:1 to 0.9:1, and the equivalent ratio of all unsaturated groups in the vinyl group containing compound and multifunctional acrylic ester to the activated hydrogen is greater than 1.05:1.

The Dammann patent relates to an improvement in several prior patents. It teaches a composition containing a Michael addition reaction product of a Michael

donor and Michael acceptor, formed in the presence of a new catalyst system comprising an epoxide moiety and a quaternary salt. Dammann teaches that the epoxide moiety material can be glycidyl methacrylate ("GMA"). It is further taught at lines 30 et seq., that the epoxy moiety-containing material can be added separately to the reaction mixture and will react to act to form the catalyst with the quaternary salt *in situ*.

A catalyst, by definition, is a material which accelerates the reaction taking place between the reactants without entering into the reaction itself. Therefore, any GMA in the catalyst cannot become a part of the Michael product. The prior rejection accepts this fact but indicates that under some circumstances free GMA may be present in the reaction mixture. The rejection is thus premised on the assumption that any excess glycidyl methacrylate is a Michael reaction reactant and will become a part of Dammann's product. It is respectfully submitted that this contention is not well taken for the following reasons.

Both the Final Rejection and the Advisory Action asserts that GMA is a Michael acceptor because it contains a ketone adjacent to an alkene group. However, the group next to the alkene is carbonyl (-COO-) and not ketone ( $>C=O$ ). Also, had this assertion been correct, then methyl methacrylate would also be a Michael acceptor, but Dammann explicitly says it is "inert" and does not become a part of the Michael reaction product, at column 7 lines 44-48. Similarly, Imanzadeh teaches "although the [Michael addition] reaction was also applicable to acrylates..., methacrylates...were not

suitable Michael acceptors...." (Abstract), and theorizes on page 7358 that the reason is that methacrylates such as methyl methacrylate are sterically hindered  $\alpha,\beta$ -unsaturated esters. There are no scientific reasons from either a sterical viewpoint or electronic configuration viewpoint why the methacrylate group in GMA should react differently from the methacrylate group in methyl methacrylate.

Dammann used an epoxide-functional vinyl compounds such as GMA for the purpose of catalyst formation and did not intend them to become a part of the product. The patent teaches that the Michael acceptors are multiacrylates at column 2, lines 65 et seq. No methacrylates, multi or otherwise, and particularly not GMA, are described as Michael reactants.

Claims 4, 9, and 32 (and the claims dependent on them) as amended exclude epoxide-functional vinyl compounds such as GMA. These claims, as well as the other claims of this application, recite a Michael addition reaction product of three components, one of which is a Michael addition acceptor monovinyl-containing compound. As apparent from this language, and as more particularly stated on page 9, Michael addition acceptors are those compounds capable of entering into the Michael addition reaction. Nothing of record teaches GMA is capable of entering into the claimed Michael addition reaction, and to the contrary, the record indicates methacrylates do not become a part of the reaction product.

In light of the foregoing, the early issuance of a Notice of Allowance is respectfully solicited.

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Respectfully submitted,

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